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09/490,761	01/24/2000	Daniel W. Crocker	CISCP131/1842	7600

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EXAMINER

DEMICO, MATTHEW R

ART UNIT	PAPER NUMBER
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2611

DATE MAILED: 11/19/2003

5

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/490,761

Applicant(s)

CROCKER ET AL.

Examiner

Matthew R Demicco

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-15, 19-22, 24, 27-29, 31-38, 40-62, 65 and 67-72 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-15, 19-22, 24, 27-28, 59-62, 65 and 67-72 is/are allowed.
- 6) ☒ Claim(s) 29, 31-38 and 40-58 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This action is responsive to an amendment filed 9/22/03. Claims 3-15, 19-22, 24, 27-29, 31-38, 40-62 and 65 are pending. Claims 1-2, 16-18, 23, 25-26, 30, 39, 63-64 and 66 are canceled. Claims 67-72 have been added. Claims 3-4, 6-8, 10, 14, 19-22, 24, 27-29, 32-33, 37, 59, 62 and 65 have been amended. The Examiner accepts the proposed drawing corrections and hereby withdraws all objections to the drawings and specification. The Examiner further withdraws the 35 U.S.C. 112 rejection of Claims 3 and 38 in light of Applicant's Figure 9. The objections to claims 32, 37 and 48 are withdrawn in light of the amendment.

Response to Arguments

2. Applicant's arguments filed with respect to Claims 29 and 33 have been fully considered but they are not persuasive. Regarding these claims, Applicant has amended the claims to include the limitation of a cable network with cable modems and a CMTS. However, Applicant's disclosed prior art teaches exactly that which Applicant has added to the claims (See Figure 2). Applicant further argues that, "different timestamp counters have traditionally been used," but does not make any mention of this in the claims themselves. The Examiner's cited prior art of Eidson teaches synchronization of master and slave nodes in a distributed system via a communication link (Col. 2, Lines 6-9) which may include a wide area network such as an Ethernet network (Col. 2, Lines 63-64) using TDMA (Col. 3, Line 1). Eidson's invention clearly reads on a distributed network of devices that one of ordinary skill in the art would understand to

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comprise cable modems as disclosed by Applicant's Figure 2. Therefore, Applicant's amended Claims 29 and 33 do not further distinguish the invention over the prior art.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 29, 32-38, 42-54 and 56-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art in view of U.S. Patent No. 6,370,159 to Eidson.

Regarding Claim 29, Applicant's admitted prior art discloses a Head End of an access network (210), the access network comprising a plurality of nodes (261, 262), the Head End comprising a plurality of physically distinct network interfaces to the access network (212, 205, 222, 225), each network interface comprising a group of distinct ports to nodes on the access network. Further disclosed is that the access network is a cable network, the plurality of nodes are cable modems, and the Head End is a CMTS (Applicant's Figure 2). What is not disclosed, however, is a master time reference device which maintains and updates a current time reference or a slave time reference device in communication with the master time reference device, thereby allowing each network interface to obtain the current time reference at the same time so that the plurality of network interfaces are in synchronization. Eidson discloses a method for synchronizing time reference devices in an access network (Col. 2, Lines 21-26) where at least one

synchronization signal (Col. 2, Lines 48-52) is provided to a first and second access controller (Col. 2, Lines 6-26) and the signal is utilized at the first and second access controllers in such a manner that the first and second time reference devices are in synchronization with each other (Col. 2, Lines 21-26). Eidson also discloses a master time reference device (See Figure 1), which maintains and updates a current time reference. The method of Eidson further discloses an access network (See Figure 1, 12) wherein the media access controllers (20, 21) include time reference devices (See Figure 2, 162). The method of Eidson discloses the implementation of a network using the TDMA protocol (Col. 3, Line 1), which is the same as the prior art cable modem system disclosed by Applicant. A plurality of slave time reference devices are disclosed (See Figure 1) that are in communication with the master time reference device, thereby allowing each network interface to obtain the current time reference at the same time over the parallel network (12) so that the plurality of network interfaces are in synchronization. Eidson is evidence that ordinary workers in the art would understand the benefits of providing a synchronization signal and synchronizing multiple access controllers in the Head End of a TDMA network. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Applicant's admitted prior art with the method of synchronization of Eidson in order to implement redundancy/fail-over and increase timing accuracy/reduce signal overlap in a TDMA network.

Regarding Claim 32, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 29. Applicant's admitted prior art further discloses the

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plurality of network interfaces includes a first network interface (212) residing on a first physical line card (202) and a second network interface (222) residing on a second physical line card (204).

Regarding Claim 33, Applicant's admitted prior art in view of Eidson disclose a Head End of an access network, the access network comprising a plurality of nodes, the Head End comprising a master time reference device which maintains and updates a current time reference as stated above in Claim 29. Further, Eidson discloses a plurality of slave media access controllers in communication with the master time reference device (See Figure 1) as stated above. Each of the slave media access controllers (60-62) are responsive to control signals (Col. 6, Lines 24-39) from the master time reference device to use the current time reference to synchronize itself with other slave media access controllers in the Head End as stated above. Further disclosed is that the access network is a cable network, the plurality of nodes are cable modems, and the Head End is a CMTS (Applicant's Figure 2).

Regarding Claim 34, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 33. Eidson further discloses that each of the plurality of slave media access controllers includes a respective slave time reference device (See Figure 1). Each of the slave media access controllers is responsive to control signals from the master time reference device (Col. 6, Lines 24-39) to use the current time reference to synchronize its respective slave time reference devices in the Head End as stated above.

Regarding Claim 35, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 33. Applicant's admitted prior art further teaches a

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master media access controller (206), which includes the master time reference device.

Eidson also teaches this in Figure 1 (18).

Regarding Claim 36, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 33. The admitted prior art further discloses that each of the plurality of slave media access controllers (208) controls a respective interface to the access network (222, 225), each network interface including a distinct plurality of ports for communicating with at least a portion of the plurality of nodes (262). The network interfaces are in synchronization with each other as stated above.

Regarding Claim 37, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 36. It is inherent in such a cable modem system that users surfing the Internet could download video content over the network. This reads on the plurality of network interfaces including a first portion of interfaces which each include at least one downstream channel for providing video content. Further, it is well known in the art that cable modems co-exist with traditional television broadcasting, sharing channels on the same network.

Regarding Claim 38, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 33. It is inherent that the TDMA network of the prior art and the system of Eidson could be a wireless network as is well known in the art.

Regarding Claim 42, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 36. The prior art further discloses a first media access controller (206) and a respective first interface (212) reside on a first physical line card

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(202) and wherein a second media access controller (208) and a second respective interface (222) reside on a second physical line card.

Regarding Claim 43, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 42. The prior art further discloses the first interface including a first plurality of ports (212, 205) and wherein the first plurality of ports includes a first downstream channel transmitter (212). It is inherent that the interface could include a second downstream transmitter, just as it could include multiple upstream receivers (205).

Regarding Claim 44, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 43. It is inherent in such a cable modem system that client devices communicate with the Internet using a protocol such as TCP/IP. Further, it is well known that the client devices are assigned to a designated Internet domain. Therefore, clients associated with a first downstream channel corresponding to the first downstream channel transmitter may be assigned to a given Internet domain, and clients assigned to a second downstream channel corresponding to a second downstream channel transmitter may be assigned to the same given Internet domain.

Regarding Claim 45, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 42. The prior art discloses a first interface including a first plurality of ports (212, 205) including at least one first downstream channel transmitter (212). The second interface includes a second plurality of ports (222, 225), including at least a second downstream channel transmitter (222). It is inherent in such a TDMA cable modem system that the first downstream channel transmitter is configured

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to provide a first time reference message to a first portion of the network nodes (cable modems). Too, it is inherent that the second downstream transmitter is configured to provide a second time reference message to a second portion of the network nodes. The first and second time reference messages are derived from different media access controllers (206, 208), which are in time synchronization as stated above in Claim 1.

Regarding Claim 46, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 45. It is inherent in such a cable modem system that client devices communicate with the Internet using a protocol such as TCP/IP. Further, it is well known that the client devices are assigned to a designated Internet domain. Therefore, clients associated with at least one port from a first interface may be assigned to a given Internet domain, and clients assigned to at least one port from a second interface may be assigned to the same given Internet domain. This reads on the claimed system wherein the first and second plurality of ports each belong to the same domain.

Regarding Claim 47, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 45. It is inherent in such a cable modem system that client devices communicate with the Internet using a protocol such as TCP/IP. Further, it is well known that the client devices are assigned to a designated Internet domain. Therefore, clients associated with at least one port from a first interface may be assigned to a given Internet domain, and clients assigned to at least one port from a second interface may be assigned to a different Internet domain. This reads on the claimed system wherein the first and second plurality of ports each belong to a different domain.

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Regarding Claim 48, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 33. Eidson further discloses the master time reference device asserts a "timing event" packet via the network to the slave time reference devices (Col. 6, Lines 25-30). This signal causes the slave devices to latch a subsequent data packet containing a traceable time value. The timing event packet reads on the claimed DATA_VALID output line for indicating transmission of valid data to each slave controller. Eidson further discloses providing a data packet containing a traceable time value after the timing event packet as stated above in Claim 11. This data packet reads on the claimed DATA line as it provides data to each slave access controller.

Regarding Claim 49, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 48. Eidson further discloses the master timer reference device including a data packet containing a traceable time value after the timing event packet as stated above in Claim 11. This data packet reads on the claimed LOAD_DATA signal as it causes each access controller to simultaneously load the time reference data from its internal memory into its time reference device (Col. 6, Lines 30-39).

Regarding Claim 50, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 48. As stated above in Claims 48 and 49, the master time reference device utilizes communication lines between the slave devices in order to pass signals. The slave time reference devices must inherently have these lines for receiving the data from the master. This reads on the claimed slave media access controllers including a DATA_VALID input line for receiving the signal from the master time reference device and a DATA input line for receiving the data. In the system of Eidson,

the communication lines may be Ethernet (Col. 2, Line 63) or any other appropriate serial or network connection that is well known in the art.

Regarding Claim 51, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 50. Eidson discloses each slave media access controller "latching" the transmitted time reference data received from the master time reference device as stated above in claim 11. This reads on a holding register for storing time reference data.

Regarding Claim 52, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 50. Eidson further discloses that each access controller is configured to load time reference data received on the data input line into the holding register (latch) as stated above. Further, Eidson discloses loading the time reference data from the holding register into the slave time reference device upon an occurrence of an event (Col. 6, Lines 24-38). The event is the timing data packet as disclosed by Eidson.

Regarding Claim 53, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 52. Eidson further discloses that each master time reference device transmits a `LOAD_DATA` signal (timing event) as stated above. This signal must be carried on an output line, such as the network of Eidson. Further, each slave media access controller must inherently include an input line for this signal as stated above. The claimed event is an assertion of a `DATA_LOAD` (timing event) signal at the master time reference device (Col. 6, Lines 24-38).

Regarding Claim 54, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 52. Eidson further discloses asserting a "timing event"

packet via the network to the slave time reference devices (Col. 6, Lines 25-30). This signal causes the slave devices to latch a subsequent data packet containing a traceable time value. The timing event packet reads on the claimed DATA_VALID signal and the latching of timing event data reads on the loading of the time reference data within an internal memory device. It is inherent that the timing event signal must be de-asserted such that it can be re-asserted at a later time to initiate another synchronization event.

Regarding Claim 56, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 34. Eidson further discloses a counter driven by an oscillator is used to keep time (Col. 2, Lines 32-42). This reads on the claimed timestamp counter of the master and slave time reference devices.

Regarding Claim 57, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 33. Eidson further discloses that the master time reference device in the Head End includes a clock signal derived from a network source such as the well-known Network Time Protocol (NTP) (Col. 8, Lines 8-13). The clock signal is provided to the master time reference device and each of the slave media access controllers as disclosed.

Regarding Claim 58, Applicant's admitted prior art in view of Eidson disclose a system as stated above in Claim 57. It is inherent that the NTP server that the master time reference device could be configured to get its updates from a stratum clock source, that is, a primary NTP server that has reference clock attached to it and receives updates via radio from an official time transmitter.

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5. Claims 31, 40-41 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art in view of Eidson and further in view of U.S. Patent No. 5,751,220 to Ghaffari.

Regarding Claims 31 and 40, Applicant's admitted prior art in view of Eidson disclose a device as stated above in Claims 29 and 33. What is not disclosed, however, is including a back-up time reference device for maintaining and updating the current time reference, and for providing the current time reference to each of the slave time reference devices at times when a failure is detected at the master device. Ghaffari discloses a network of electronic devices (See Figure 6A) that are time-synchronized to a master unit (56M-1), which transmits a synchronization signal (Col. 9, Lines 20-27). Ghaffari also discloses a back-up time reference device (56M) for maintaining and updating the current time reference and providing the current time reference to each of the slave time reference devices (56S) at times when a failure is detected at the master device (Cols. 9-10, Lines 66-2). Ghaffari is evidence that ordinary workers in the art would understand the benefits of having a backup time synchronization device in a system where synchronization is essential to the proper operation of the network. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the system of the Applicant's admitted prior art in view of Eidson with the back-up time reference device of Ghaffari in order to provide redundancy in the event of a failure such that the network would be able to continue operating normally.

Regarding Claim 41, Applicant's admitted prior art in view of Eidson and further in view of Ghaffari disclose a system as stated above in Claim 40. Ghaffari also discloses

that the back-up master time reference device is configured as part of a slave media access controller. In the system of Ghaffari, each slave is part of a daisy chain starting with the master. As each master fails, the next slave in the chain assumes its role (Cols. 9-10, Lines 66-15).

Regarding Claim 55, Applicant's admit prior art in view of Eidson and further in view of Ghaffari disclose a system as stated above in Claim 40. Ghaffari further discloses a system wherein the master time reference device includes at least one output status line for communicating an operating status of the master device to the back up devices (Col. 11, Lines 42-59).

Allowable Subject Matter

6. Claims 3-15, 19-22, 24, 27-28, 59-62, 65 and 67-72 are allowed.

Regarding Claim 8, the Examiner found no prior art, nor motivation to combine said prior art, that teaches a method of synchronizing time reference devices in the Head End of an access network with a plurality of distinct physical line cards and time reference devices, a synchronization signal to time-synchronize each device with each other, a first downstream channel transmitter and at least one first upstream receiver, and a second downstream channel transmitter and receiver, wherein a first time reference message is provided to a first node on the first downstream channel associated with the first time reference device and data is received from the first node at the head end via the second upstream channel including all subsequent limitations.

Regarding Claim 19, the Examiner found no prior art, nor motivation to combine said prior art, that teaches a method of configuring an access network comprising a Head End and a plurality of nodes, including an access control system having a plurality of media access controllers with respective interfaces to the network, each including a distinct time reference device and a distinct plurality of ports for communicating with a plurality of nodes, comprising synchronizing the time reference devices in each of the controllers, assigning selected ports from the interfaces to particular domains where at least one port from a first interface is assigned to a first domain, and where at least one port from a second interface is assigned to the first domain in a cable modem network where the domains are DOCSIS domains.

Regarding Claim 28, the Examiner found no prior art, nor motivation to combine said prior art, that teaches a method of synchronizing nodes in an access network to a common time reference wherein a first node is provided with a first time reference message via a first downstream channel associated with a first media access controller, and a second node is provided with a second time reference message via a second downstream channel associated with a second media access controller, and wherein the nodes are synchronized together in a cable modem network across different physical line cards using the DOCSIS standard and wherein the first and second nodes are cable modems belonging to a first DOCSIS domain.

Regarding Claims 59, 62, 65 and 67-72, see Claims 8, 19 and 28 above.

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Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew R Demicco whose telephone number is (703) 305-8155. The examiner can normally be reached on Mon-Fri, 9am - 5pm.

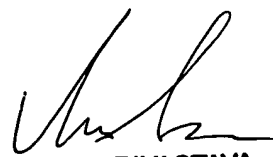
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Faile can be reached on (703) 305-4380. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-5359.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.



mrd

November 7, 2003


VIVEK SRIVASTAVA
PRIMARY EXAMINER